

**California Marine Life Protection Act Initiative**  
**SAT Evaluation of Round 2 MPA Proposals for the MLPA South Coast Study**  
**Region: Habitat Representation, Habitat Replication, MPA Size and**  
**MPA Spacing Analyses**  
*Revised July 23, 2009*

The MLPA Master Plan Science Advisory Team (SAT) evaluates marine protected area (MPA) proposals in relation to the goals of the MLPA. SAT evaluations of habitat representation and habitat replication primarily address goals 1 and 4 of the MLPA, which focus on ecosystems and habitats. SAT evaluations of MPA size and spacing between MPAs primarily address goals 2 and 6 of the MLPA, which focus on marine life populations and connectivity. The discussion and associated figures and tables below compare the six stakeholder generated MPA proposals developed during the second round of the MLPA process in the South Coast study region and the ‘no change’ alternative for each of the four evaluations listed above.

Methods for these analyses, including explanations of levels of protection (LOPs), are described in an associated document: *Draft Methods Used to Evaluate Marine Protected Area Proposals in the MLPA South Coast Study Region* (“SAT Evaluation Methods Document”).

### **Habitat Representation (Goals 1 and 4)**

The key questions that the habitat representation analysis addresses are:

- How well are key habitat types represented in MPA proposals?
- What are the proposed levels of protection for these habitat types?
- How well are habitats and levels of protection distributed across the study region?

In order to answer these questions, the SAT compared the percentage of available habitat included within each of the proposals across various levels of protection (Figures 1.1 to 1.3). The SAT also considered the distribution of habitat representation across each of the five bioregions identified in the south coast study region. Further details on these methods are available in the “SAT Evaluation Methods Document.”

Habitat abundance varies by habitat type, and many habitats are unevenly distributed across the study region (Figure 1.1), which affects the ease with which proposals can capture each habitat within an MPA proposal. For instance, soft-bottom habitats are generally more abundant across the study region than rocky reef habitats. Additionally, soft-bottom habitats are more prevalent along the mainland, while rocky reef habitats are most abundant at the offshore islands. Deep rocky reef habitat (>100 meters depth) is extremely rare across the study region and occurs in only a few isolated locations; thus capturing this habitat in an MPA proposal may prove challenging. Estuarine habitats occur exclusively in the two mainland bioregions and are concentrated in the southern portion of the mainland.

The results of the habitat representation analysis are displayed below (Figures 1.2 to 1.4 and Table 1). For the key habitats present in the study region, these figures display the percentage of that habitat included in MPAs in each of the second-round proposals. Results are grouped by SAT-assigned LOP. For rare and unique habitats (Table 1), the number of MPAs is

summarized for each of the second-round proposals that include each habitat. The rare and unique habitats evaluation is conducted only for MPAs that achieve a LOP at or above moderate-high.

Overall, the six proposals show some convergence at the very high level of protection, probably due to similar MPA designs in many locations. In general, the four internal proposals (Lapis 1, Lapis 2, Opal, and Topaz) perform similarly with respect to habitat representation, while the two external proposals (External A and External B) tend to represent a smaller proportion of available habitats in MPAs with an LOP at or above moderate-high. State MPAs within the Channel Islands National Marine Sanctuary (CINMS) were included in all proposals and contribute significantly to habitat representation for most open-coast habitats. Two military closures proposed at San Clemente Island were included in all proposals per guidance from the MLPA Blue Ribbon Task Force (BRTF). These military closures contributed to representation of the shallower open coast habitats across all proposals. Another proposed military closure at San Nicolas Island was not included in any of the six proposals per stakeholder discretion. Most habitats have at least 10% representation at or above the moderate-high LOP in all six proposals (Figures 1.2 to 1.4). Exceptions include beaches and estuarine habitats. Highlights from habitat-specific analyses include:

***Shoreline habitats (beaches, rocky shores and surfgrass)***

Beaches are one of the least represented habitats across all proposals. The six proposals include six to ten percent of beach habitat in very-high-protection State Marine Reserves (SMRs). Three percent of beach habitat occurs within the CINMS (Figure 1.3a). When high and moderate-high protection levels are considered, the proposals include seven to eleven percent of beach habitat in MPAs. An additional two percent of beach habitat is included in military closures.

The six proposals include 14–18% of rocky shores in SMRs (11% occurs within the CINMS) and 10–17% of surfgrass in SMRs (eight percent occurs within the CINMS) (Figure 1.2a–b). When high and moderate-high protection levels are considered, 15–19% of rocky shores and 12–18% of surfgrass is protected by the six proposals. An additional one percent of rocky shore and two percent of surfgrass habitat is included in military closures. Rocky shores were generally less represented in MPAs and military closures in the Eastern Channel Islands bioregion relative to other parts of the study region.

***Nearshore rocky habitats (0–30m rocky reef, “persistent” kelp, and maximum kelp)***

Nearshore rocky habitats are evaluated using three separate but complementary measures: 0–30m rocky reef (with or without kelp), “persistent” kelp (present at least 3 out of 7 years), and maximum kelp (present at least 1 out of 7 years). Representation of these three habitat measures was similar within each proposal due to the high degree of overlap between the measures.

The six proposals include 9–15% of nearshore rocky habitats (encompasses all three measurements) in SMRs (six percent occurs within the CINMS) (Figure 1.2c–e). When high and moderate-high protection levels are considered, the proposals include 10–16% of nearshore rocky habitat in MPAs. An additional four percent of each of the three measurements for nearshore rocky habitat is protected in military closures. For each measurement Opal and Lapis include a slightly greater proportion of nearshore rocky habitat at higher levels of protection than other proposals.

***Deep rocky reef habitats (30–100m, 100–200m, and 200–3000m rock reef)***

Overall, proposals protected 17–23% of 30–100m rocky reef habitat (eight percent occurs within the CINMS and an additional two percent is included in military closures).

Rocky reef habitat at 100–200m is rare throughout the study region and is mainly concentrated in the west and mid Channel Island bioregions (Figure 1.2g). Proposals protected 14–23% of the 100–200m rocky reef habitat (12% is protected in MPAs in the CINMS). Military closures did not contribute to representation of the 100–200m rocky reef habitat probably due to areas of deep unknown substrate surrounding San Clemente Island. In general the proposals protect relatively similar proportions of 30–100m and 100–200m rocky habitats; however, Lapis 1 protects more rocky reef habitat at the very high level of protection. External B includes more of the 100–200m rocky habitats at moderate-high and less at very high.

Rocky reef habitat at 200–3000m is both rare and patchily distributed throughout the study region, occurring mainly in the north mainland and east Channel Islands bioregions. Representation of deepest rocky reef habitat in SMRs varied widely between proposals (Figure 1.1h), from 0% in External B to 39% in Lapis 1 and Topaz. Proposals that included an MPA at Pt. Dume achieved the highest representation of 200–3000m rocky reef. When high and moderate-high protection levels are considered, the proposals include 11–40% of 200–3000m rocky reef habitat. Neither SMRs within the CINMS nor military closures contributed to representation of this habitat, probably due to areas of deep unknown substrate surrounding San Clemente Island. Rocky reef habitat deeper than 200m was generally less represented in the east Channel Islands bioregion as compared to other parts of the study region although a high percentage of available mapped habitat occurs at Santa Catalina Island.

***Soft-bottom habitats (0–30m, 30–100m, 100–200m, and 200–3000m soft bottom)***

Soft-bottom habitats are abundant and relatively evenly distributed across the study region, with the exception of the deepest soft-bottom habitat which occurs mainly in the eastern Channel Islands bioregion. All proposals protect a substantial (>10%) proportion of these abundant soft bottom habitats at or above moderate-high protection (Figure 1.3 b–e), so that large areas of these habitats are protected. Military closures included less than one percent additional 0–30m soft bottom habitat and did not contribute to representation of 30–100m, 100–200m, and 200–3000m soft bottom habitat, probably due to areas of deep unknown substrate surrounding San Clemente Island.

***Estuarine habitats (estuary, coastal marsh, eelgrass, and tidal flats)***

Estuarine habitats occur almost exclusively on the mainland and are concentrated in the south mainland. Thus, neither MPAs within the CINMS nor military closures contribute to representation of estuarine habitats.

The six proposals include 4–10% of estuaries in SMRs and 4–22% at high and moderate-high protection levels (Figure 1.4a). Lapis 1 and Lapis 2 protect the greatest proportion of estuaries.

Protection of coastal marsh varies markedly among proposals (Figure 1.4b) with External B protecting 11% and Lapis 1 and 2 protecting 44% in SMRs. When high and moderate-high protection levels are considered, the proposals include 11–48% of coastal marsh in MPAs.

Eelgrass is both rare and patchily distributed across the study region. The majority of eelgrass occurs in the south mainland bioregion, much of that in San Diego Bay. This patchy distribution led to a high degree of variability between proposals. The six proposals include 1–5% of eelgrass in SMRs and 2–37% in high to moderate-high protection levels (Figure 1.4c). Notable are large areas of eelgrass protected at moderate-high protection in Lapis 1 and Lapis 2.

Tidal flats are not comprehensively mapped throughout all estuaries in the study region. The six proposals protect 7–13% of mapped tidal flats in SMRs (Figure 1.4d). When high and moderate-high protection levels are considered, the proposals include 7–25% of tidal flats.

***Rare and unique habitats (open-coast eelgrass, elk kelp, oil seeps, sulfide vents, and canyons)***

In general, rare and unique habitats are not mapped with sufficient resolution to assess the relative proportion of available habitat included in proposals. Table 1 summarizes the number of MPAs at or above moderate-high protection that are known to contain rare and unique habitats. This summary is compiled by proposal. Those habitats included in the CINMS MPAs are called out on a separate line and also included in the totals for each proposal.

**Table 1. Number of proposed MPAs at or above moderate-high protection which include rare and unique habitats**

Proposal	Open coast eelgrass	Elk kelp	Oil seeps	Sulfide vents <sup>a</sup>	Canyons
CINMS	4	0	1	0	1
Proposal 0	6	1	1	0	2
Lapis 1	9(1)	2(1)	3	0	4
Lapis 2	9(1)	1(1)	3	0	2
Opal	10(1)	2(1)	3	0	3
Topaz	9(1)	2(1)	3	0	4
External A	9(1)	1(1)	3	0	2
External B	7(1)	1(1)	0	0	3

*Totals for each proposal include those habitats captured in CINMS MPAs.*

*( ) indicates military closures*

<sup>a</sup> *Only one sulfide vent location is currently mapped in the study region, at Palos Verdes.*

## Habitat Replication (Goals 1 and 4)

Replication of habitats within 3–5 SMRs in each biogeographical region (Point Conception to the Mexico border) is required by the MLPA. Additionally, for within-habitat ecosystem representation and monitoring and evaluation opportunities, the SAT has recommended that habitats are replicated in at least one MPA in each of the five bioregions of the SCSR, to the extent possible. In order to be counted in the replication analysis the MPA must meet the minimum size guideline (nine square miles<sup>1</sup>), and a given habitat within the MPA must be present in a sufficient amount to encompass 90% of associated biodiversity (see habitat replication thresholds in the “SAT Evaluation Methods Document” for further details.)

The results of the habitat replication analysis are displayed below (Figures 2.1 to 2.6). In figures 2.1 and 2.2, the number of MPAs that contain a significant amount of each habitat is shown for each MPA proposal at very high, high, and moderate-high protection levels. Figure 2.3 contains similar information to 2.1 and 2.2, but is conducted only for depth ranges. This information helps to deal with limited data available for deeper habitats. Figure 2.4 is similar to those described above, but simply for estuaries. Figures 2.5 and 2.6 show, for each proposal, the number of bioregions where a habitat replicate is proposed in an MPA. This analysis is conducted at the three highest levels of protection. Gray boxes denote habitats for which a proposal does not have at least one replicate in each possible bioregion.

<sup>1</sup> Unless otherwise specified, all references to miles (linear or square) in this document refer to statute miles.

Across the entire South Coast Study Region, the six proposals meet the replication guidelines for all but the rarest habitats within no-take SMRs. At the level of individual bioregions, however, several proposals fail to replicate all habitats within each of the possible bioregions at or above moderate-high protection.

State MPAs within the CINMS contribute significantly to replication for all open coast habitats. The number of habitat replicates contained within the CINMS ranges from one, for the deepest rock and soft bottom habitats, to six or seven for some shoreline and nearshore habitats.

Proposed military closures contribute one or two replicates for most open coast habitats that occur shallower than 100m depth.

Deep rock (100–3000m) is rare and unevenly distributed throughout the study region and thus difficult to replicate in multiple MPAs. Most proposals add one or two replicates of deep rock habitat to the one replicate contained in the CINMS MPAs.

Eelgrass is rare and unevenly distributed across the study region making it difficult to replicate in multiple MPAs. All proposals include just one replicate of eelgrass at or above moderate-high protection.

Many habitats were not replicated across all available bioregions at very high protection. Notably, External B does not replicate any habitat across all bioregions at very high protection.

At least half the proposals failed to replicate 30–100 and 100–3000m rock and 30–100m and 100–200m soft bottom habitats across all bioregions even when high and moderate-high protection MPAs were considered.

Highlights from habitat-specific replication analyses include:

***Shoreline habitats (beaches, rocky shores and surfgrass)***

Beaches are the least replicated shoreline habitat with the six proposals encompassing 4–9 replicates, 3 of which occur within the CINMS (Figures 2.1 to 2.2). Military closures add one additional replicate of beach habitat. All proposals have replicates of beach habitat across all five bioregions at or above high protection. Only External B does not have replicates of beach in very high protection across all bioregions (Figure 2.5b).

The six proposals encompass 7–12 replicates of rocky shores and 6–11 replicates of surfgrass in SMRs, of which 7 replicates of rocky shore and 6 of surfgrass are included within the CINMS (Figures 2.1 to 2.2). Military closures contribute an additional 2 replicates of each habitat. All proposals have replicates of rocky shore and surfgrass habitat across all five bioregions at or above moderate-high protection. Several proposals (Lapis 2, External A, and External B) do not have replicates of at least one of these two habitats in very high protection across all bioregions (Figure 2.5a).

***Nearshore rocky habitats (0–30m rocky reef, “persistent” kelp, and maximum kelp)***

In general, proposals include the greatest number of replicates of maximum kelp, followed by slightly fewer replicates of 0–30m rock, while “persistent kelp” is the least replicated of the nearshore rocky habitats.

The six proposals include 4–11 replicates of nearshore rocky habitats (encompasses all three measures) at very high protection, of which four replicates of “persistent” kelp and 0–30m rock and six replicates of maximum kelp occur within the CINMS (Figures 2.1 to 2.2). Military closures add 2 additional replicates of each nearshore rocky habitat. Notably, External B includes no replicates of nearshore rocky habitats at very high protection outside of the CINMS. At or above mod-high LOP, replication of nearshore rocky habitats increases across all proposals to a range of 7–14 replicates.

At the bioregion scale, all proposals except Lapis 2 replicate the nearshore rocky habitats across all bioregions at or above moderate-high LOP. Several proposals (Lapis 2, Topaz, External A, and External B) do not have replicates of at least one of these three habitat measures in very high protection across all bioregions (Figure 2.5a).

***Deep rocky reef habitats (30–100m and 100–3000m rock reef)***

The six proposals include five to seven replicates of 30–100m rocky reef at very high protection, four of which occur within the CINMS (Figures 2.1 to 2.2). Military closures add one additional replicate of 30–100m rock. At or above mod-high LOP, replication of 30–100m rocky habitats increases across most proposals to a range of six to eight replicates. Only Lapis 1, Topaz, and External A include replicates of this habitat across all bioregions at or above moderate-high LOP (Figure 2.5a).

Rocky reef habitat deeper than 100m depth is rare and thus difficult to replicate. One replicate of this deepest rocky reef habitat is included in the CINMS MPAs, and all proposals except External B add 1–2 additional replicates at or above moderate-high protection (Figures 2.1 to 2.2). Only Opal replicates this deepest rocky reef habitat at or above moderate-high LOP across the three bioregions where it is available (Figure 2.5a).

***Soft-bottom habitats (0–30m, 30–100m, 100–200m, and 200–3000m soft bottom)***

Soft-bottom habitats are abundant and generally well replicated across the study region. In general, proposals contain the greatest number of replicates of 30–100m soft bottom, with slightly fewer of 0–30m and 100–200m soft bottom, and the fewest replicates of 200–3000m soft bottom (Figure 2.5b).

The six proposals include seven to thirteen replicates of the two shallower soft-bottom habitats (0–30m and 30–100m) at very high protection, six of which occur within the CINMS (Figures 2.1 to 2.2). Military closures add one additional replicate of 0–30m soft bottom. When replication is considered at or above moderate-high LOP, replication of these soft bottom

habitats increases across all proposals to a range of 11–16 replicates. All proposals replicate 0–30m soft bottom habitat at or above high protection across all bioregions. On the other hand, several proposals (Lapis 1, Lapis 2, and External A) do not include replicates of 30–100m soft bottom habitat at or above moderate-high LOP across all bioregions (Figure 2.5b).

The proposals include five to nine replicates of 100–200m soft bottom at very high protection, three of which occur within the CINMS (Figures 2.1 to 2.2). Military closures do not contribute to replication of this habitat. When high and moderate-high protection levels are considered, replication of 100–200m soft-bottom habitat increases across all proposals to a range of 10–12 replicates. Several proposals (Lapis 1, Lapis 2, and External A) do not include replicates of 100–200m soft bottom habitat at or above moderate-high LOP across all bioregions (Figure 2.5b).

The proposals include two to five replicates of the deepest soft-bottom habitat (200–3000m) at very high protection, one of which occurs within the CINMS (Figures 2.1 to 2.2). Military closures do not contribute to replication of this habitat. When high and moderate high protection are considered, replication of this habitat increases in all proposals to a range of six to eight replicates. All proposals fail to replicate 200–3000m soft bottom habitat in at least one of the four available bioregions at very high protection, but all proposals achieve replication across the four bioregions at or above high protection (Figure 2.5b).

### ***Estuarine habitats (estuary, coastal marsh, eelgrass, and tidal flats)***

Neither MPAs within the CINMS nor military closures contribute to replication of estuarine habitats.

Replication of estuaries at very high protection ranges from three replicates in External B to 8 replicates in the two Lapis proposals (Figure 2.4a). High and moderate high protection adds additional replication to the two Lapis and Topaz proposals for a total of three to twelve replicates (Figure 2.4c). All proposals replicate estuaries across the two available bioregions at very high protection (Figure 2.6b).

Replication of coastal marsh closely mirrors estuarine replication with three to seven replicates at very high protection (Figure 2.4a), and three to eleven at or above moderate-high protection (Figure 2.4c). All proposals replicate estuaries across the two available bioregions at very high protection (Figure 2.6b).

Eelgrass is rare and unevenly distributed across the estuaries. All proposals include one replicate of eelgrass at very high protection (Figure 2.4a).

Replication of tidal flats was not evaluated.



## **MPA Size**

Size guidelines were developed to provide for the persistence of important bottom-dwelling fish and invertebrate groups within MPAs. (See size in the “SAT Evaluation Methods Document” for further details). To accommodate adult movements and life history needs, size guidelines state that MPAs should have a minimum alongshore span of 3–6 miles (preferably 6–12.5 miles), should extend offshore to deep waters, and should have a minimum area of 9–18 square statute miles (preferably 18–36 square miles).

The size analysis considers the number of MPA “clusters” that meet the minimum and preferred SAT size guidelines at very high, high, and moderate-high protection levels. Estuarine MPAs are not included in the size analysis.

Figure 3.1 displays results of the MPA size analysis. Each proposal is displayed on a separate line in this analysis and each circle indicates the size of an MPA “cluster”, with bigger MPA clusters further to the right and smaller MPA clusters further to the left. An MPA cluster may be a single MPA, or several MPAs that are adjacent to one another. The pink area to the far left of the figure indicates MPA clusters that fall below the minimum MPA size recommended by the SAT (nine square miles). The yellow area in the middle of the figure indicates MPA clusters that are bigger than the minimum size guideline, but smaller than the preferred size recommended by the SAT (18 square miles). The blue area to the right of the figure indicates MPA clusters that fall within the preferred size range recommended by the SAT (18–36 square miles). These results are also tabulated on the right hand side of the figure. Since MPAs within the CINMS are included in all proposals, the sizes for these MPAs are provided separately from the proposals for ease of display.

The proposals are similar in terms of the number of SMRs and size range of MPA clusters, with the exception of proposal External B which has fewer SMRs. All proposals have at least two SMRs within the preferred size range. Except for External A all proposals have more SMRs below the minimum size range than within or above the minimum size range (Figure 3.1a). At a high level of protection additional MPA clusters move into the preferred size range for all proposals (Figure 3.1b). Some additional MPA clusters move into the minimum size range at the moderate-high protection level (Figure 3.1c).

## **MPA Spacing**

Spacing guidelines were developed to provide for the dispersal of important bottom-dwelling fish and invertebrate groups between MPAs and to promote connectivity in the network. Further details on these methods are available in the “SAT Evaluation Methods Document.” To facilitate dispersal and connectivity spacing guidelines along the mainland recommend that MPAs be placed with 31–62 miles of each other. Since marine populations are generally habitat-specific, the spacing evaluation is conducted for each habitat; to be included in the spacing analysis habitat must be present in sufficient quantity to count as a replicate (see above). MPAs or MPA clusters must also meet the minimum size guidelines (nine square

miles) to count as a replicate in the spacing analysis. Spacing is not evaluated at the offshore islands where other science guidance takes precedence.

Spacing analyses include (1) the maximum distance (gap) between MPA clusters that meet the minimum and preferred SAT size guidelines for each habitat and (2) the number of spacing gaps that exceed SAT spacing guidelines (> 62 square miles) between adjacent MPA clusters (nine square miles) for a given habitat. Both analyses are conducted at very high, high, and moderate-high protection levels.

### ***Maximum Distance (Gap)***

Figures 4.1 and 4.2 display the results of the MPA spacing analysis on the MPA clusters that meet the minimum and preferred size guidelines. The height of each bar indicates the maximum distance between two patches of “protected” habitat in a given proposal. In order to count as a protected habitat, sufficient area to encompass 90% of biodiversity for a given habitat must exist in an MPA cluster of at least minimum SAT size. These maximum distances, or gaps, for each habitat may be compared to the spacing guidelines, 31–62 miles apart, indicated by the horizontal dashed red lines.

A key caveat to drawing conclusions from spacing evaluations is that it may not be possible to meet the spacing guidelines for some habitats that are not well represented in the study region or are patchily distributed, such as rock at 30–100m and 100–2000m along the mainland, soft 200–3000m, and to a lesser extent, kelp persistence (~75 square miles due to gap between Palos Verdes and San Elijo area) (Figure 1.1). Even though it may not be possible to meet the spacing guidelines across the entire study region for each of these habitats, it may be possible to meet the spacing guidelines in at least a portion of the study region. The spacing guidelines were developed to facilitate connectivity for larval stages which differ by species. While the guidelines were developed by assessing larval duration for a large number of organisms the inherent variability dictates that for biodiversity the spacing guidelines should be met or be as near as possible for the broadest set of habitats possible.

No proposals met the spacing guidelines for all possible habitats at any protection level.

In general, the six second-round proposals varied from one another in terms of spacing.

There was a high degree of variability among the proposals for the four habitats that are either rare or patchily distributed in the SCSR. For example, maximum gaps for rock 30–3000m habitats at the very high protection level were substantially smaller in proposal Lapis 1 than in the other proposals.

At the very high, high, and moderate-high protection levels, proposal Lapis 1 came the closest to meeting the spacing guidelines across all habitats collectively (i.e. the maximum distance (gap) between MPA clusters across all habitats as a whole is generally less than other proposals). However, each of the other proposals meet the SAT guidelines for some habitats where Lapis 1 does not but those proposals also have greater gaps for other habitats.

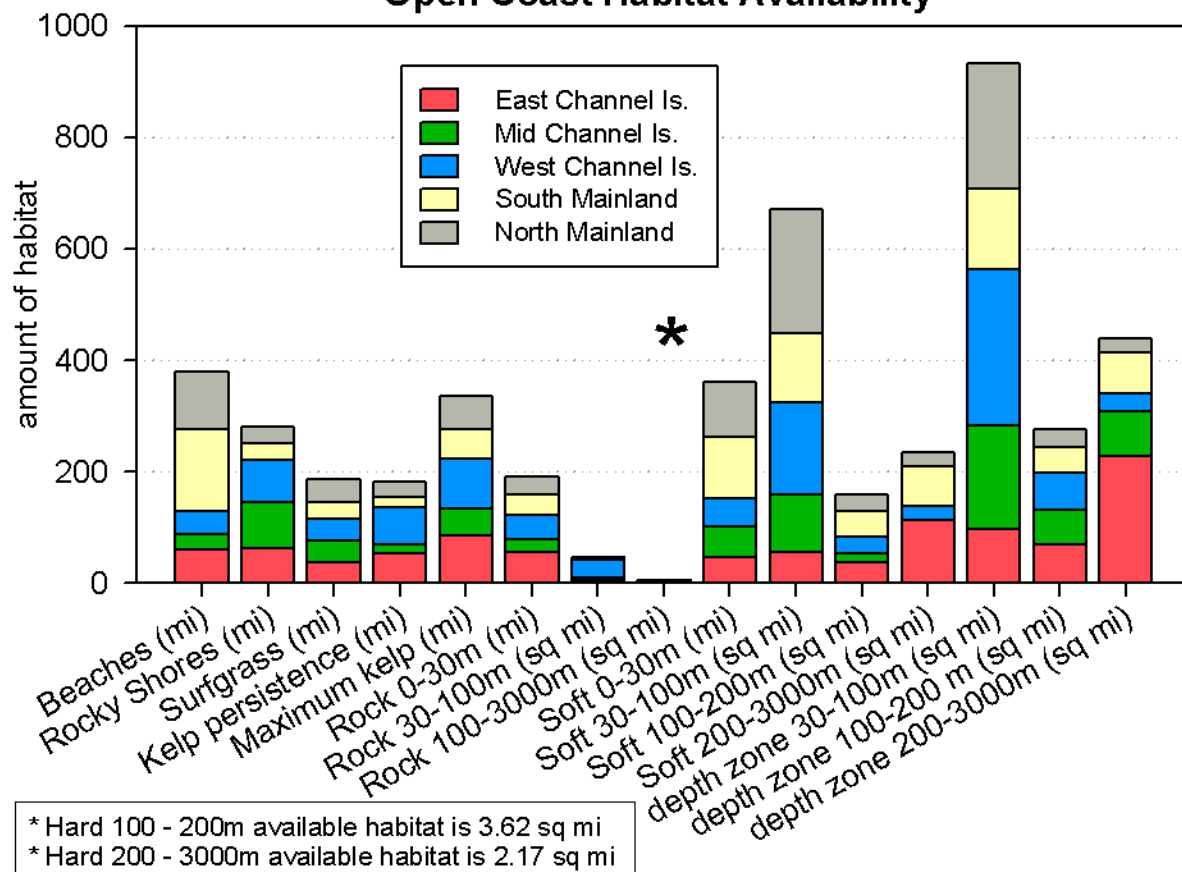
The maximum gaps tended to decrease for many habitats from the very high protection level to the high protection level, but at the high protection level the two external proposals had gaps that well exceeded the spacing guidelines.

At the moderate-high protection level, Lapis 1 in most habitats was at or very close to the minimum spacing guidelines, while the other proposals still had at least several habitats with substantially large maximum gaps.

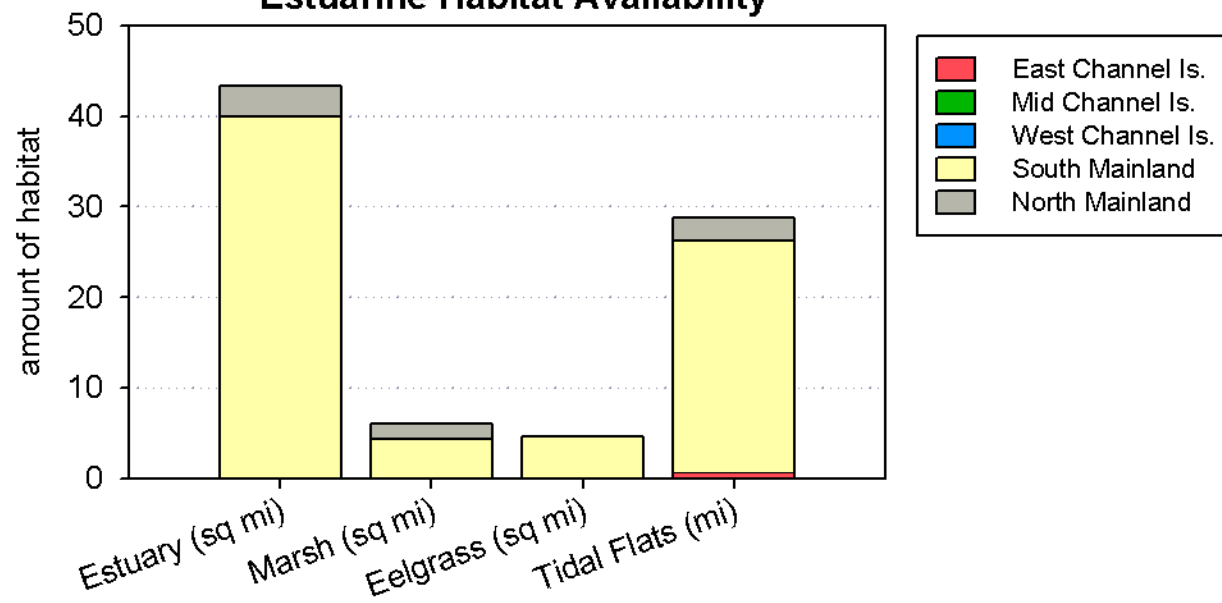
### ***Number of Spacing Gaps***

Table 4.3a–f provides the number of spacing gaps that exceed SAT spacing guidelines between adjacent MPA clusters for a given habitat. The location and distance of each gap is also identified for each habitat. The intent of this analysis is to provide the SCRSG detailed information about specific spacing gaps by habitat for each proposal, in order to identify where spacing gaps can be reduced in the development of third-round proposals. For example, there are three gaps that exceed SAT spacing guidelines for beach habitat in proposal Lapis 1 at the very high protection level (Table 4.3a), including a 76-mile gap between the Laguna Beach Cluster to the southern boundary of the SCSR, a 71-mile gap between the Lachusa Cluster and the Laguna Beach Cluster, and a 66-mile gap between Coal Oil Point SMR and the Lachusa Cluster. For the same habitat other proposals have either met the spacing guidelines or have differing gap distance or locations. This specific feedback provides information that may be utilized to refine MPA design and potentially reduce the gaps in a specific habitat.

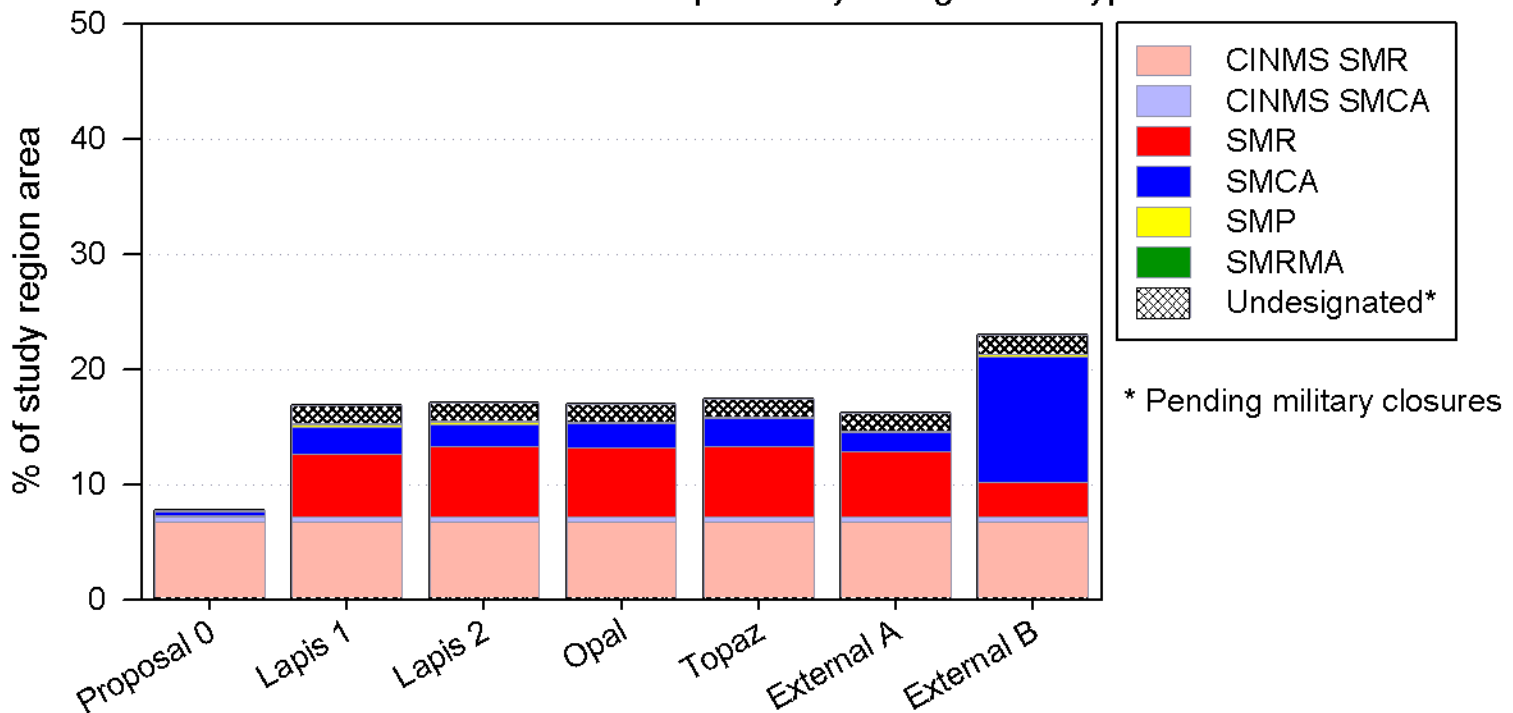
## Open Coast Habitat Availability



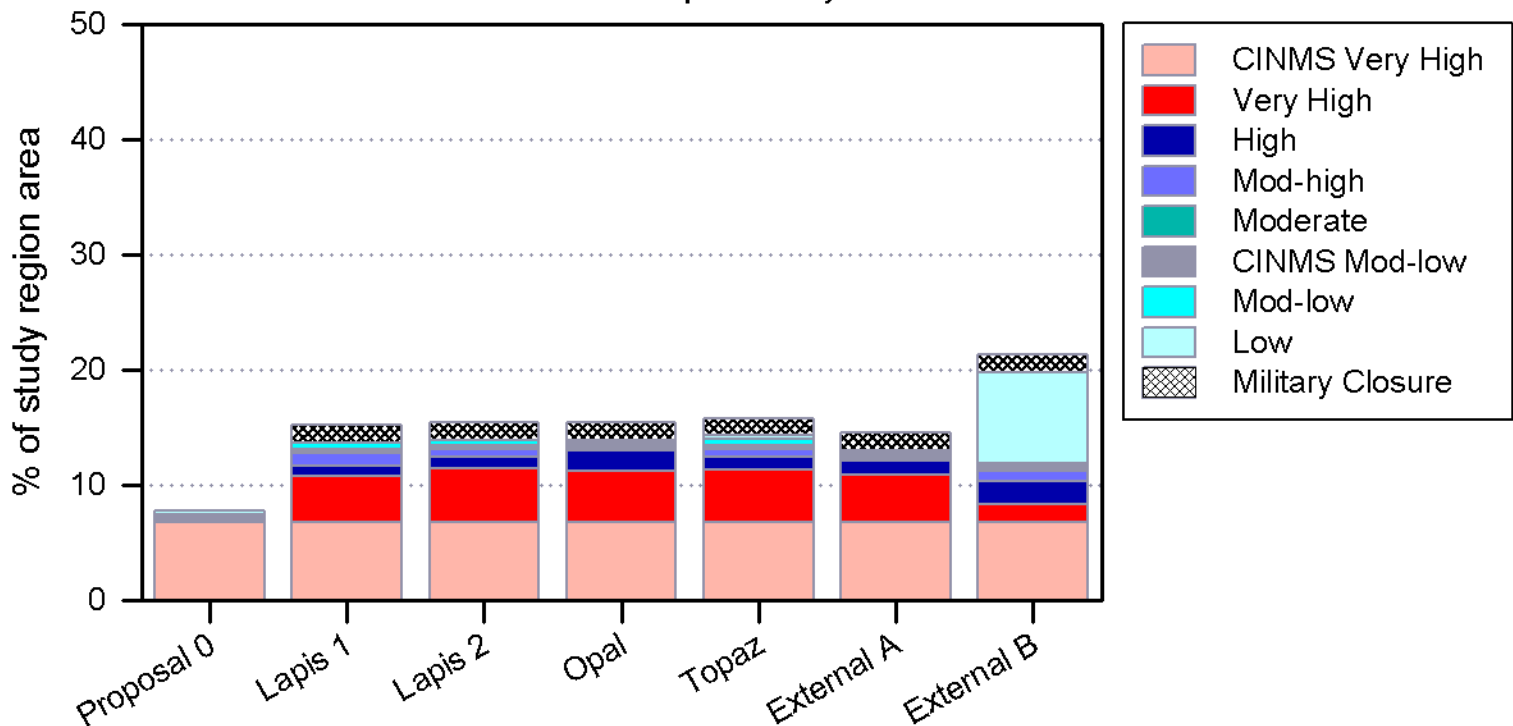
## Estuarine Habitat Availability



Round 2 Comparison of Existing MPAs (Proposal 0) and  
SCRSB and External Draft MPA Proposals by Designation Type



Round 2 Comparison of Existing MPAs (Proposal 0) and  
SCRSB and External Draft MPA Proposals by Level of Protection



**Figure 1.1: Habitat Representation - Rocky Habitats**

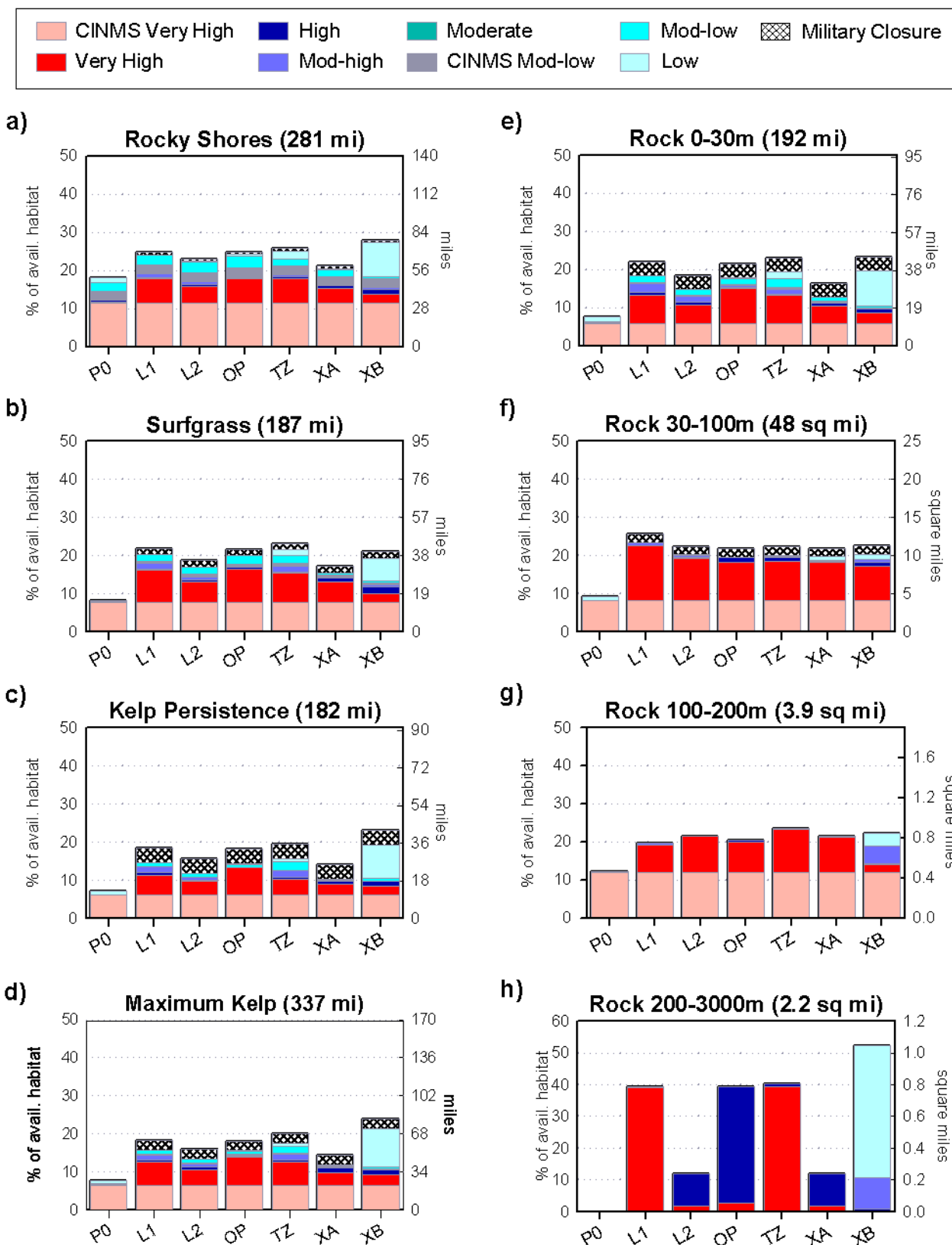
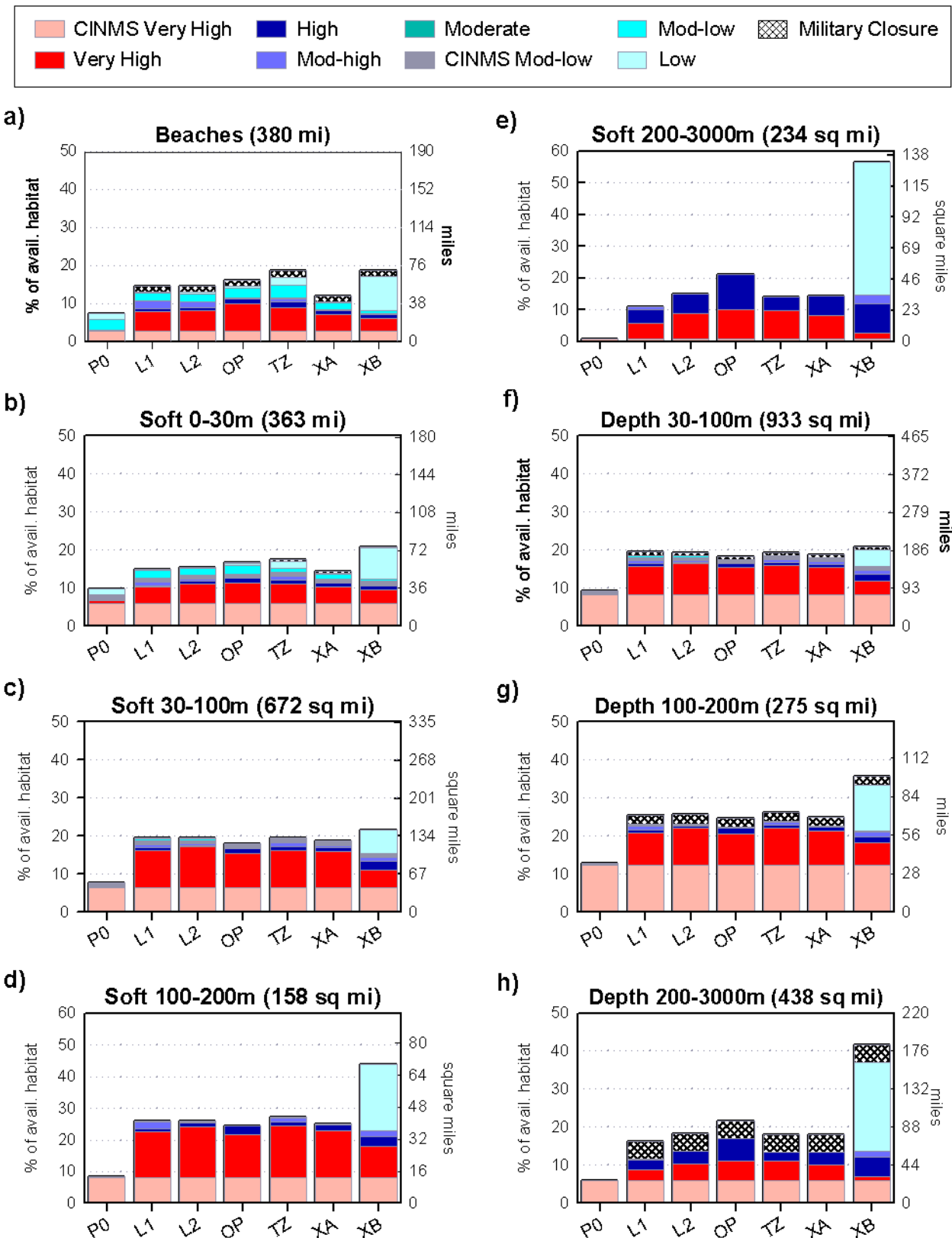
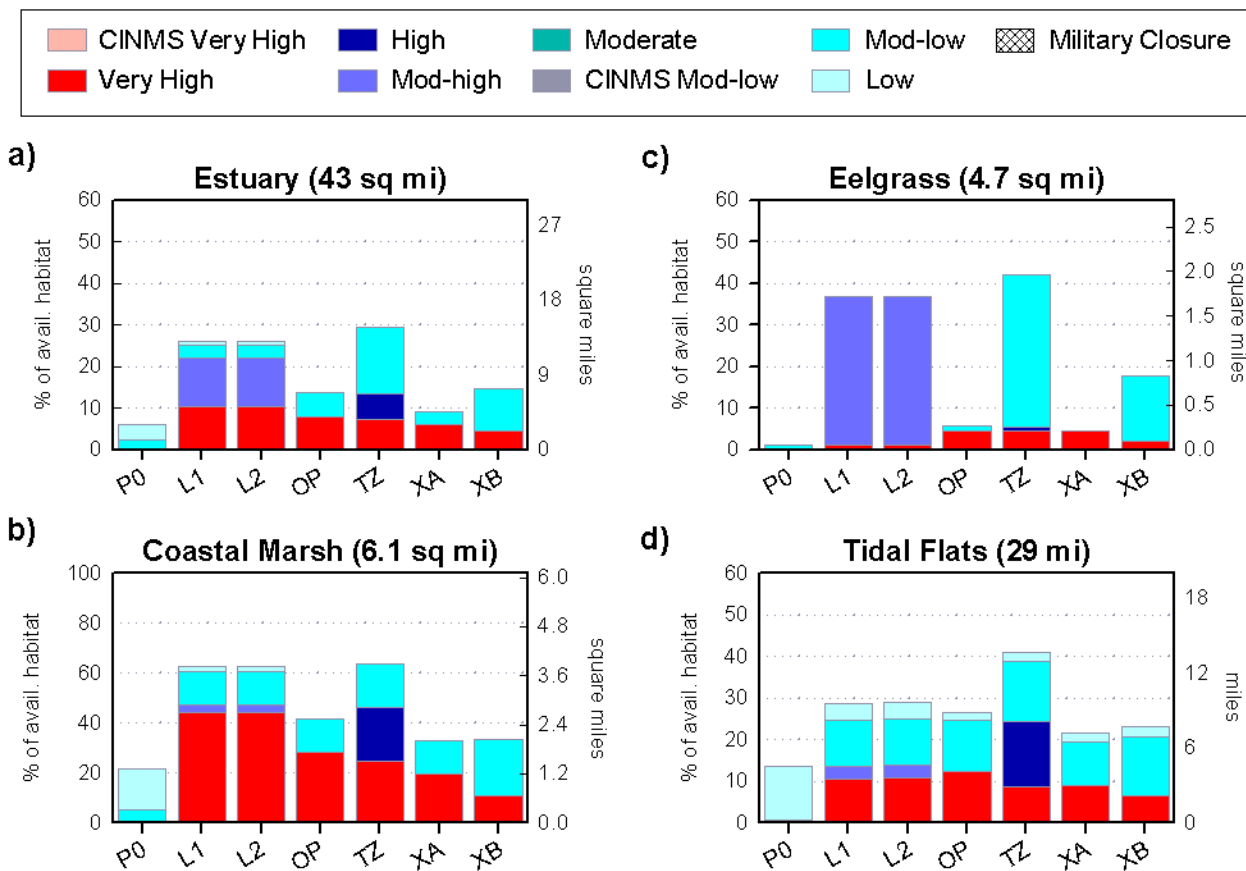


Figure 1.2: Habitat Representation - Soft Bottom Habitats



**Figure 1.3: Habitat Representation - Estuarine Habitats**





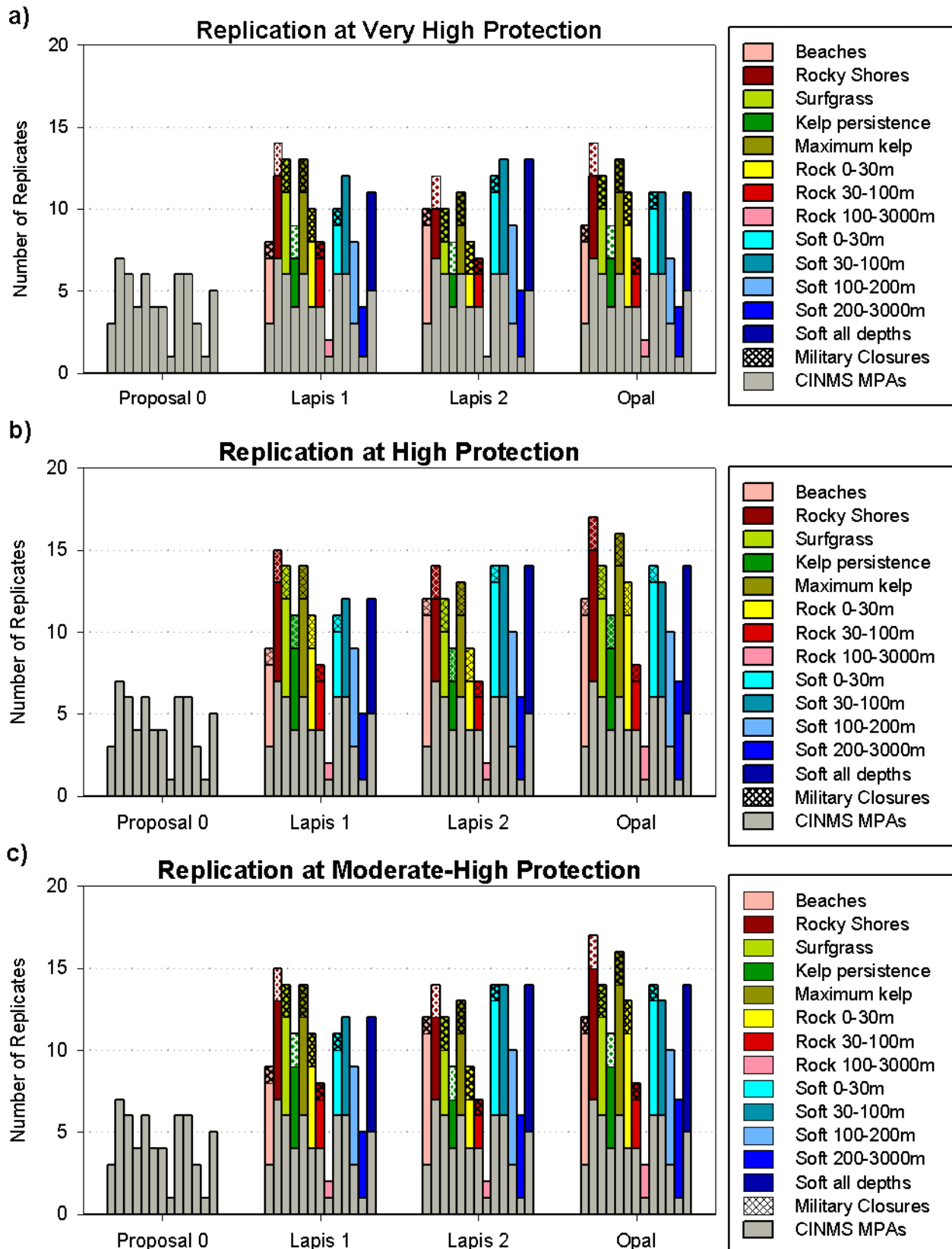
**Table 1.4: Number of MPAs at or above moderate-high protection (including proposed military closures) that include rare and unique habitats in each proposal<sup>1</sup>. Totals for each proposal include those habitats captured in CINMS MPAs.**

<b>Proposal</b>	<b>Open coast eelgrass</b>	<b>Elk kelp</b>	<b>Oil seeps</b>	<b>Sulfide vents<sup>2</sup></b>	<b>Canyons</b>
<b>CINMS</b>	4	0	1	0	1
<b>Proposal 0</b>	6	1	1	0	2
<b>Lapis 1</b>	9(1)	2(1)	3	0	4
<b>Lapis 2</b>	9(1)	1(1)	3	0	2
<b>Opal</b>	10(1)	2(1)	3	0	3
<b>Topaz</b>	9(1)	2(1)	3	0	4
<b>External A</b>	9(1)	1(1)	3	0	2
<b>External B</b>	7(1)	1(1)	0	0	3

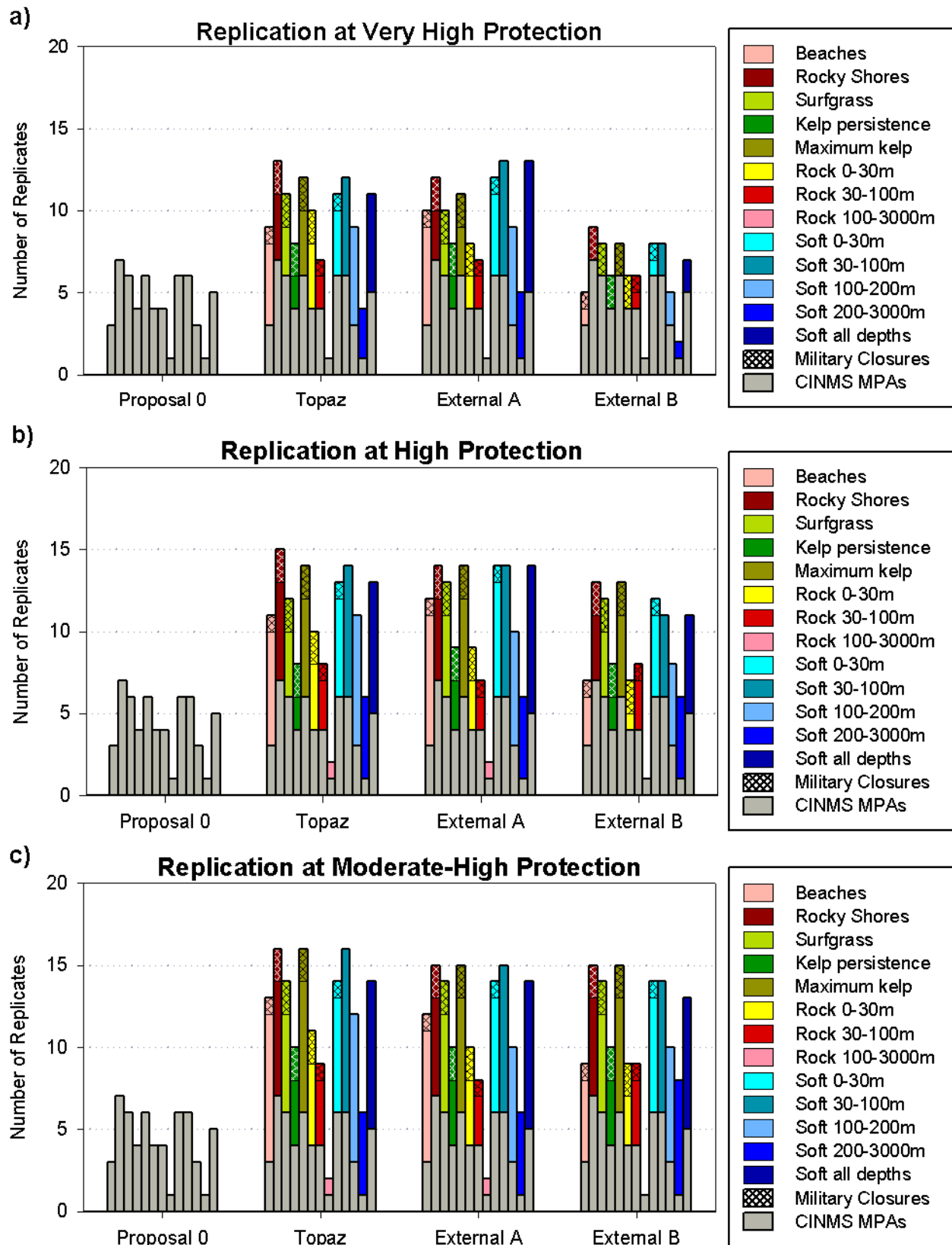
<sup>1</sup> ( ) indicates military closures

<sup>2</sup> Only one sulfide vent location is currently mapped in the study region at Palos Verdes.

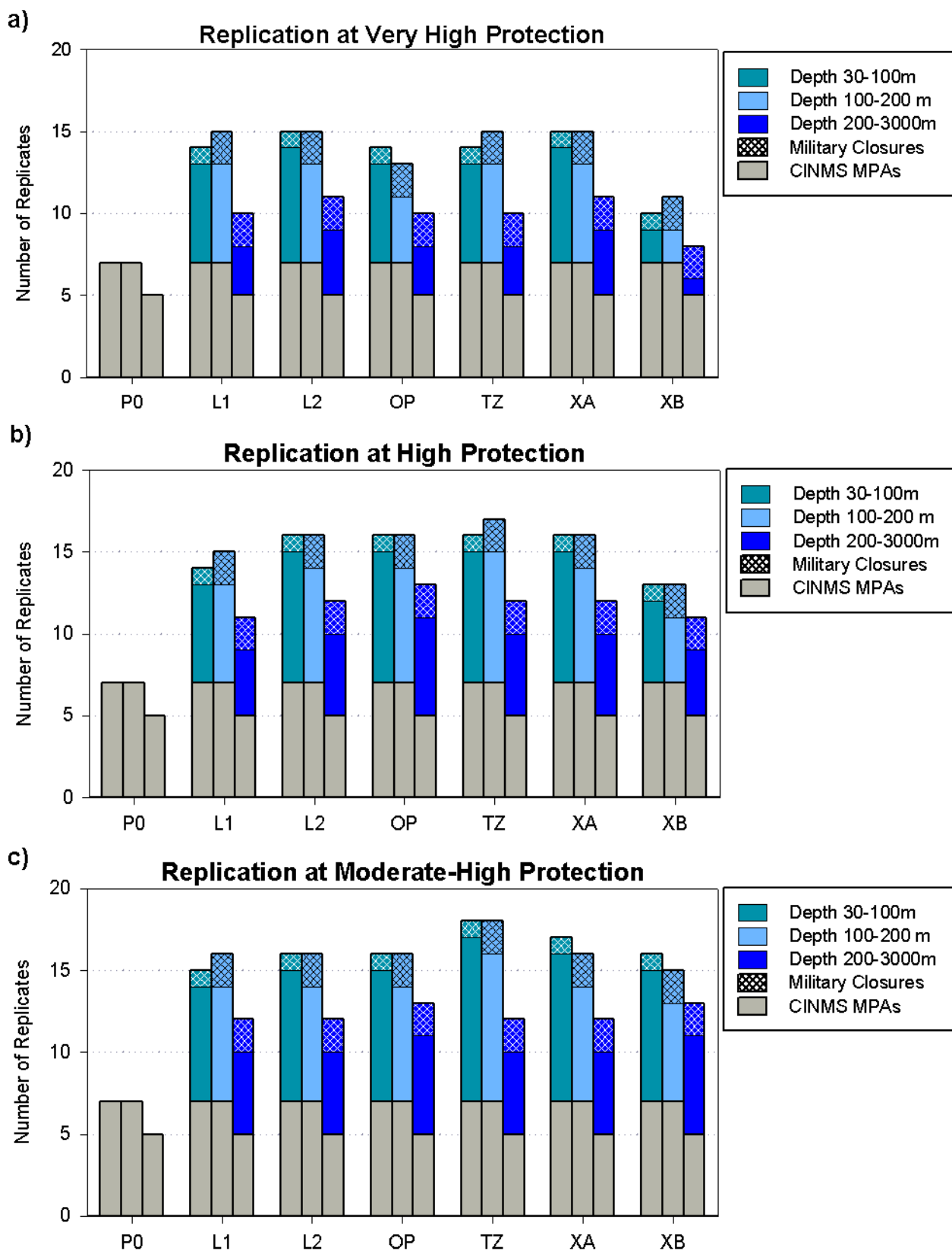
Figure 2.1: Habitat Replication by Study Region - Open Coast (Lapis & Opal)



**Figure 2.2: Habitat Replication by Study Region - Open Coast (Topaz & External)**



**Figure 2.3: Habitat Replication by Study Region - Depth Zones**



**Figure 2.4: Habitat Replication by Study Region - Estuarine Habitats**

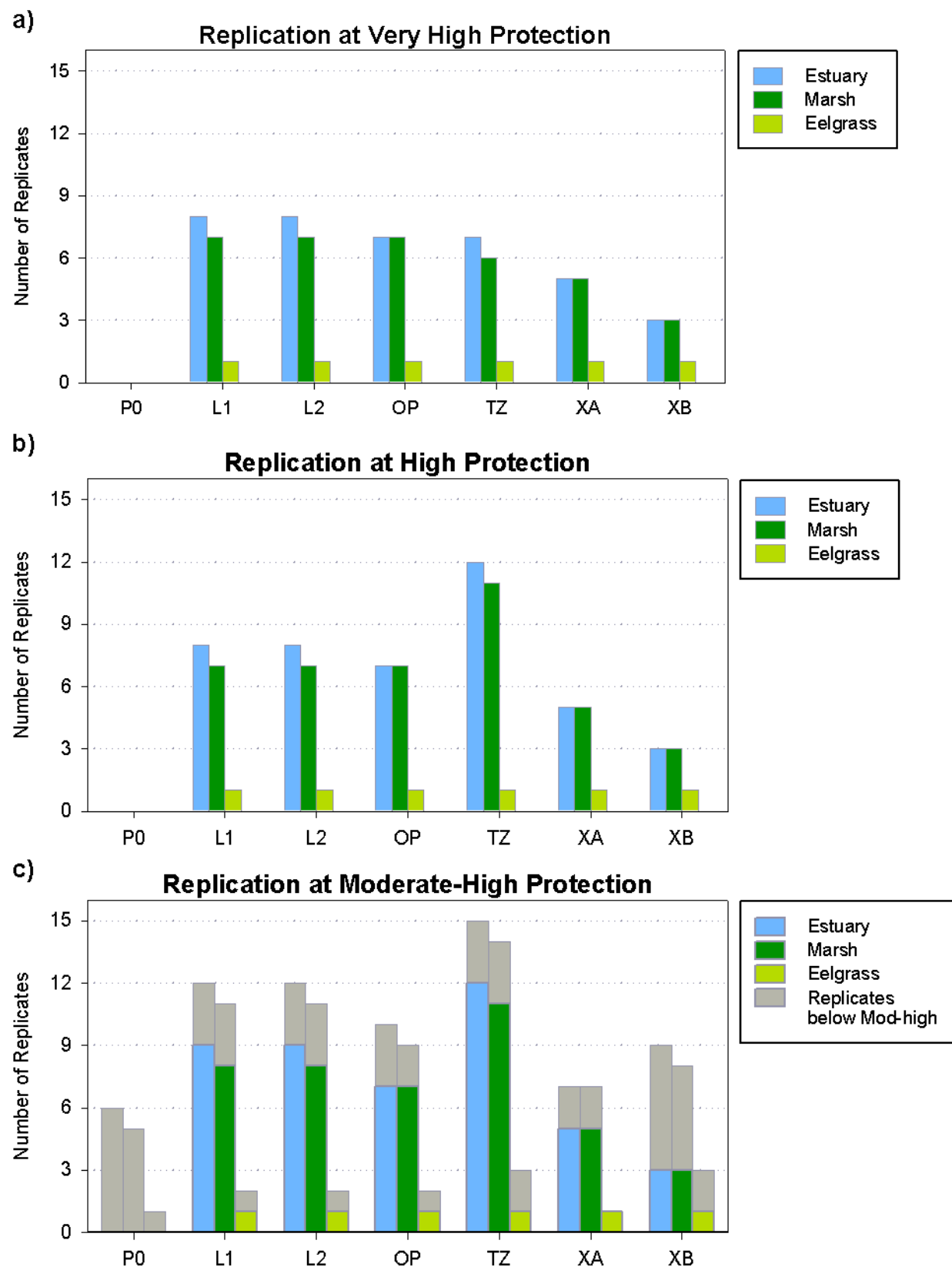


Figure 2.5: Habitat Replication by Bioregion - Rocky and Soft Bottom Habitats

a	Rocky Shores (5)			Surfgrass (5)			Kelp persist. (5)			Maximum kelp (5)			Rock 0-30m (5)			Rock 30-100m (5)			Rock 100-3000m (3)		
	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH
Proposal 0	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1
Lapis 1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	2	2	2
Lapis 2	5	5	5	4	5	5	4	4	4	5	5	5	4	5	5	4	4	4	1	2	2
Opal	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	2	3	3
Topaz	5	5	5	5	5	5	4	4	5	5	5	5	5	5	5	4	4	5	1	2	2
External A	5	5	5	4	5	5	4	4	5	5	5	5	4	5	5	4	4	5	1	2	2
External B	3	5	5	3	4	5	3	4	5	3	5	5	3	4	5	3	3	4	1	1	1

b	Beaches (5)			Soft 0-30m (5)			Soft 30-100m (5)			Soft 100-200m (5)			Soft 200-3000m (4)			Soft all depths (5)		
	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH
Proposal 0	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	2	2	2
Lapis 1	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	4	5	5
Lapis 2	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	4	5	5
Opal	5	5	5	5	5	5	4	5	5	4	5	5	2	4	4	4	5	5
Topaz	5	5	5	5	5	5	4	5	5	4	5	5	2	4	4	4	5	5
External A	5	5	5	5	5	5	4	4	4	4	4	4	3	4	4	4	5	5
External B	4	5	5	4	5	5	3	5	5	3	5	5	2	4	4	3	5	5

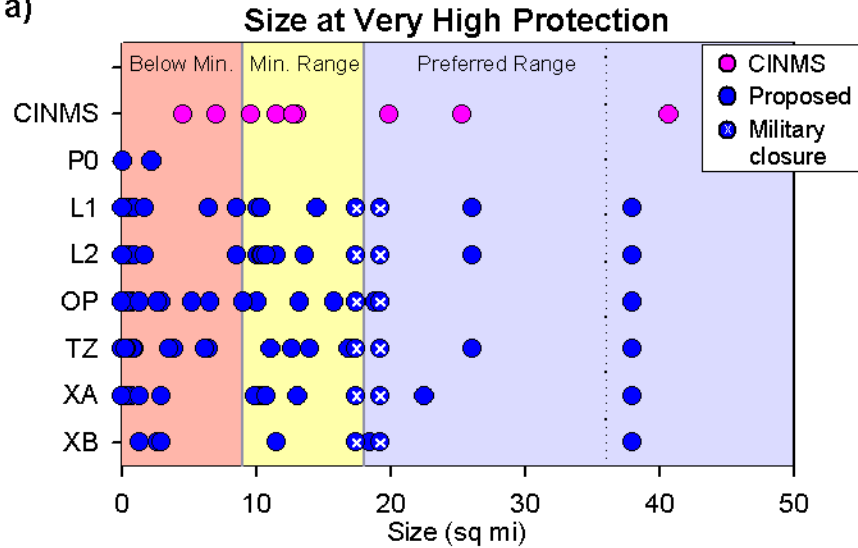
Figure 2.6: Habitat Replication by Bioregion - Depth Zones and Estuarine Habitats

a	Depth 30-100m (5)			Depth 100-200m (5)			Depth 200-3000m (5)		
	VH	H	MH	VH	H	MH	VH	H	MH
Proposal 0	2	2	2	2	2	2	2	2	2
Lapis 1	5	5	5	5	5	5	5	5	5
Lapis 2	5	5	5	5	5	5	5	5	5
Opal	5	5	5	5	5	5	4	5	5
Topaz	5	5	5	5	5	5	4	5	5
External A	5	5	5	5	5	5	5	5	5
External B	4	5	5	4	5	5	4	5	5

b	Estuary (2)			Marsh (2)			Eelgrass (1)			Tidal Flats (0)		
	VH	H	MH	VH	H	MH	VH	H	MH	VH	H	MH
Proposal 0	0	0	0	0	0	0	0	0	0	0	0	0
Lapis 1	2	2	2	2	2	2	1	1	1	0	0	0
Lapis 2	2	2	2	2	2	2	1	1	1	0	0	0
Opal	2	2	2	2	2	2	1	1	1	0	0	0
Topaz	2	2	2	2	2	2	1	1	1	0	0	0
External A	2	2	2	2	2	2	1	1	1	0	0	0
External B	2	2	2	2	2	2	1	1	1	0	0	0

Figure 3.1: Size

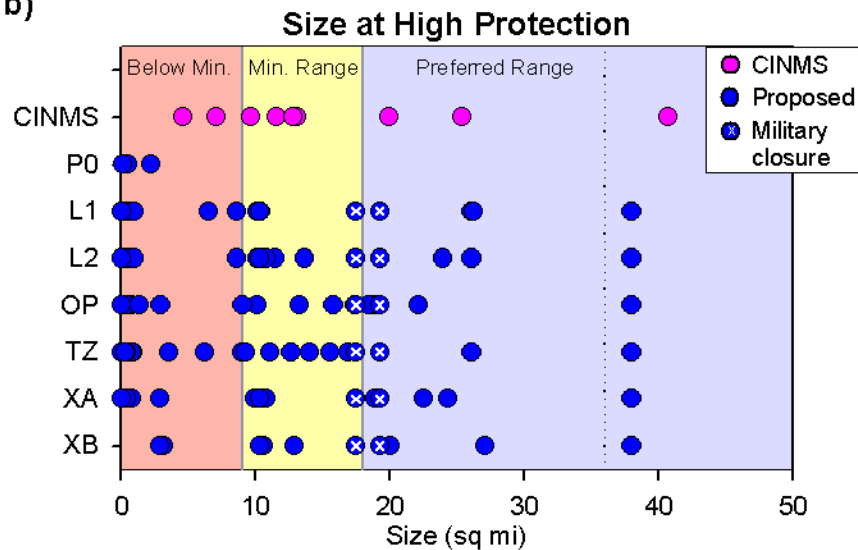
a)



Number of MPA Clusters* at Very High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	3	0	0	3
Lapis 1	7	4(1)	2(1)	13(2)
Lapis 2	6	6(1)	2(1)	14(2)
Opal	9	5(1)	2(1)	16(2)
Topaz	9	4(1)	2(1)	15(2)
External A	5	6(1)	2(1)	13(2)
External B	5	1(1)	2(1)	8(2)

\* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

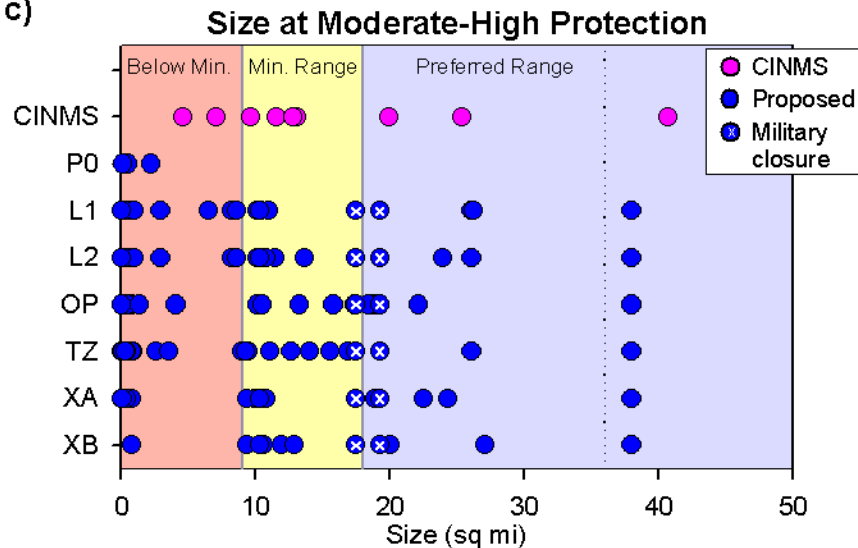
b)



Number of MPA Clusters* at High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis 1	8	4(1)	3(1)	13(2)
Lapis 2	5	6(1)	3(1)	14(2)
Opal	8	6(1)	4(1)	16(2)
Topaz	8	6(1)	2(1)	16(2)
External A	4	5(1)	4(1)	13(2)
External B	3	3(1)	3(1)	9(2)

\* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

c)



Number of MPA Clusters* at Moderate-High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis 1	8	5(1)	3(1)	16(2)
Lapis 2	7	6(1)	3(1)	16(2)
Opal	6	6(1)	4(1)	16(2)
Topaz	9	8(1)	2(1)	19(2)
External A	4	6(1)	4(1)	14(2)
External B	1	6(1)	3(1)	10(2)

\* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures



Figure 4.1: Spacing - Lapis & Opal

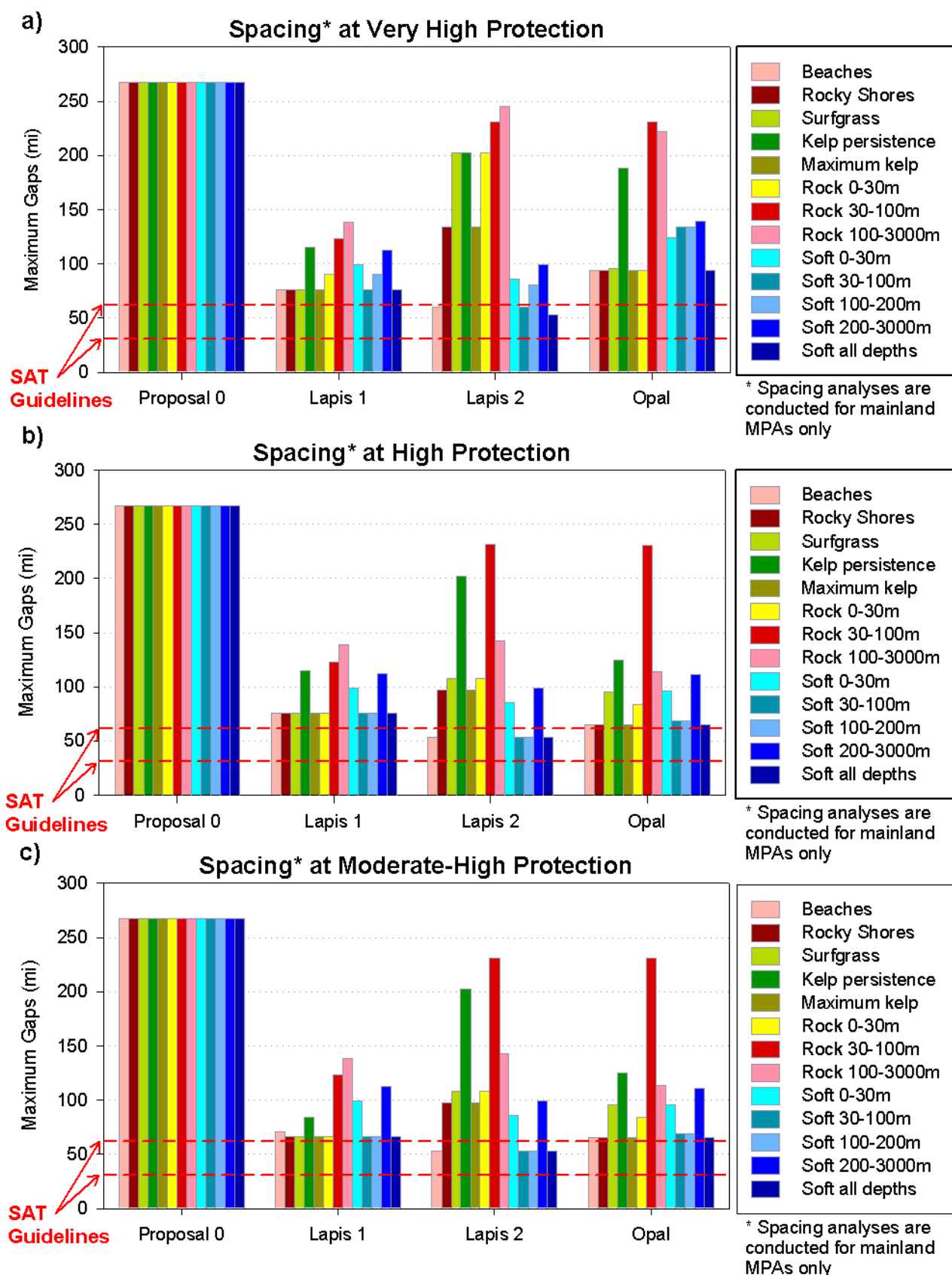


Figure 4.2: Spacing - Topaz & External

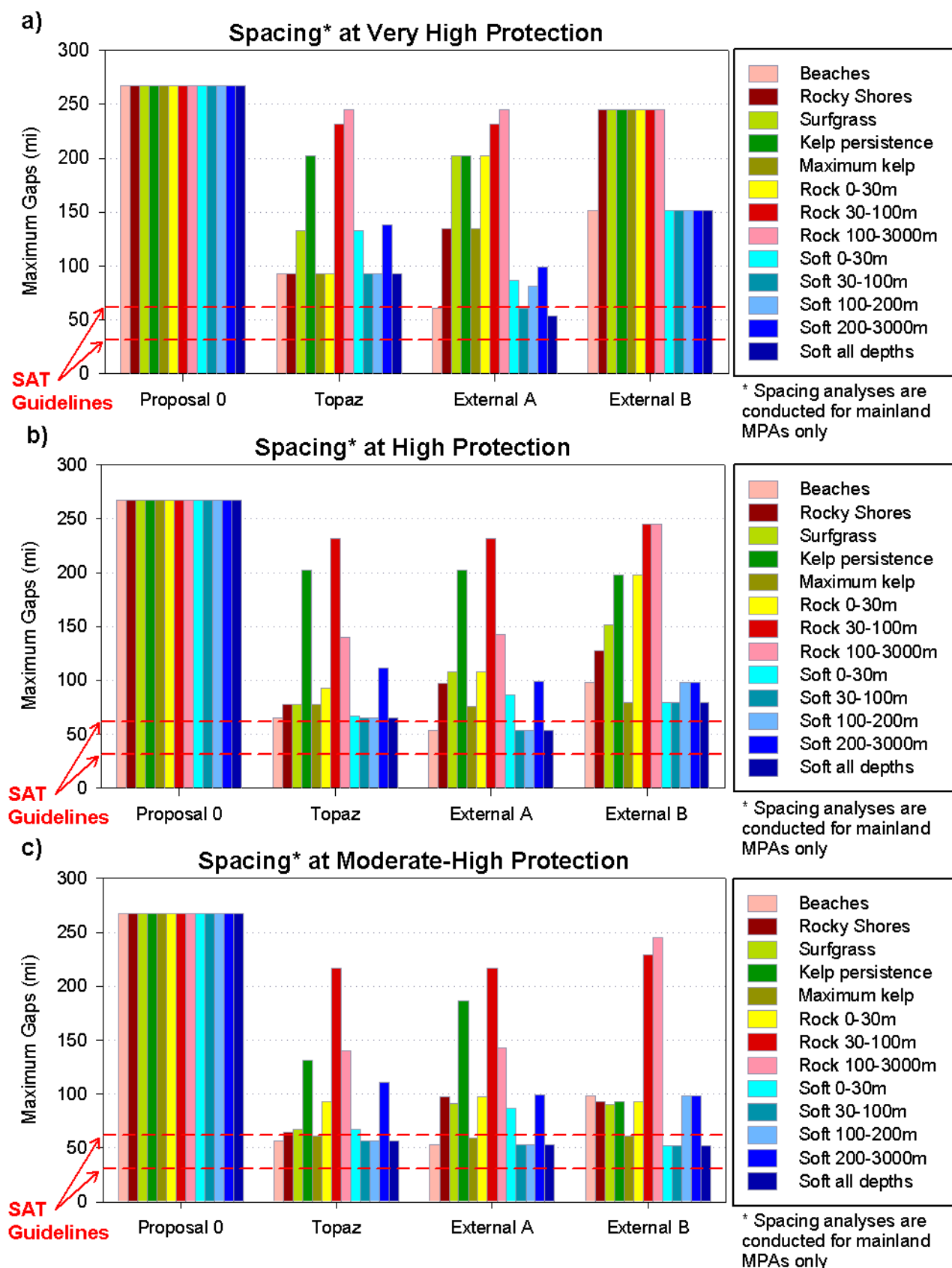


Table 4.3a

Lapis 1		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	3	76	Laguna Beach Cluster to South Boundary of SCSR	71	Lachusa Cluster to Laguna Beach Cluster	66	Coal Oil Point SMR to Lachusa Cluster
Rocky Shores	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Surfgrass	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Kelp persistence	2	115	Palos Verdes SMR to South Boundary of SCSR	91	Coal Oil Point SMR to Palos Verdes SMR		
Maximum kelp	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
hard 0 - 30m proxy	2	91	Coal Oil Point SMR to Palos Verdes SMR	76	Laguna Beach Cluster to South Boundary of SCSR		
hard 30 - 100m	2	123	Point Conception/Humqag SMR to Palos Verdes SMR	115	Palos Verdes SMR to South Boundary of SCSR		
hard 100 - 3000m	2	139	Lachusa Cluster to South Boundary of SCSR	112	Vandenberg SMR CCSR to Lachusa Cluster		
soft 0 - 30m proxy	3	99	Point Conception/Humqag SMR to Lachusa Cluster	76	Laguna Beach Cluster to South Boundary of SCSR	71	Lachusa Cluster to Laguna Beach Cluster
soft 30 - 100m	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
soft 100 - 200m	2	91	Coal Oil Point SMR to Palos Verdes SMR	76	Laguna Beach Cluster to South Boundary of SCSR		
soft 200 - 3000m	2	112	Vandenberg SMR CCSR to Lachusa Cluster	76	Laguna Beach Cluster to South Boundary of SCSR		
soft 0 - 3000m	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Estuary	1	132	Mugu Lagoon SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	136	Mugu Lagoon SMRMA to San Elijo Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Lapis 1		High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	3	76	Laguna Beach Cluster to South Boundary of SCSR	71	Lachusa Cluster to Laguna Beach Cluster	66	Coal Oil Point SMR to Lachusa Cluster
Rocky Shores	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Surfgrass	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Kelp persistence	2	115	Palos Verdes SMR to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Maximum kelp	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
hard 0 - 30m proxy	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
hard 30 - 100m	2	123	Point Conception/Humqag SMR to Palos Verdes SMR	115	Palos Verdes SMR to South Boundary of SCSR		
hard 100 - 3000m	2	139	Lachusa Cluster to South Boundary of SCSR	112	Vandenberg SMR CCSR to Lachusa Cluster		
soft 0 - 30m proxy	3	99	Point Conception/Humqag SMR to Lachusa Cluster	76	Laguna Beach Cluster to South Boundary of SCSR	71	Lachusa Cluster to Laguna Beach Cluster
soft 30 - 100m	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
soft 100 - 200m	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
soft 200 - 3000m	2	112	Vandenberg SMR CCSR to Lachusa Cluster	76	Laguna Beach Cluster to South Boundary of SCSR		
soft 0 - 3000m	2	76	Laguna Beach Cluster to South Boundary of SCSR	66	Coal Oil Point SMR to Lachusa Cluster		
Estuary	1	132	Mugu Lagoon SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	136	Mugu Lagoon SMRMA to San Elijo Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Lapis 1		Moderate-High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	71	Lachusa Cluster to Laguna Beach Cluster	66	Coal Oil Point SMR to Lachusa Cluster		
Rocky Shores	1	66	Coal Oil Point SMR to Lachusa Cluster				
Surfgrass	1	66	Coal Oil Point SMR to Lachusa Cluster				
Kelp persistence	2	84	Palos Verdes SMR to Swami's-San Elijo SMCA	66	Coal Oil Point SMR to Lachusa Cluster		
Maximum kelp	1	66	Coal Oil Point SMR to Lachusa Cluster				
hard 0 - 30m proxy	1	66	Coal Oil Point SMR to Lachusa Cluster				
hard 30 - 100m	2	123	Point Conception/Humqag SMR to Palos Verdes SMR	115	Palos Verdes SMR to South Boundary of SCSR		
hard 100 - 3000m	2	139	Lachusa Cluster to South Boundary of SCSR	112	Vandenberg SMR CCSR to Lachusa Cluster		
soft 0 - 30m proxy	2	99	Point Conception/Humqag SMR to Lachusa Cluster	71	Lachusa Cluster to Laguna Beach Cluster		
soft 30 - 100m	1	66	Coal Oil Point SMR to Lachusa Cluster				
soft 100 - 200m	1	66	Coal Oil Point SMR to Lachusa Cluster				
soft 200 - 3000m	1	112	Vandenberg SMR CCSR to Lachusa Cluster				
soft 0 - 3000m	1	66	Coal Oil Point SMR to Lachusa Cluster				
Estuary	1	132	Mugu Lagoon SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	136	Mugu Lagoon SMRMA to San Elijo Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

**Table 4.3b**

Lapis 2		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	2	134	Coal Oil Point SMR to Laguna Cluster	77	Laguna Cluster to South Boundary of SCSR		
Surfgrass	1	202	Coal Oil Point SMR to South Boundary of SCSR				
Kelp persistence	1	202	Coal Oil Point SMR to South Boundary of SCSR				
Maximum kelp	2	134	Coal Oil Point SMR to Laguna Cluster	77	Laguna Cluster to South Boundary of SCSR		
hard 0 - 30m proxy	1	202	Coal Oil Point SMR to South Boundary of SCSR				
hard 30 - 100m	1	231	Point Conception/Humqag SMR to South Boundary of SCSR				
hard 100 - 3000m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
soft 0 - 30m proxy	1	86	Point Conception/Humqag SMR to Big Sycamore Canyon SMR				
soft 30 - 100m	0						
soft 100 - 200m	1	80	Big Sycamore Canyon SMR to Laguna Cluster				
soft 200 - 3000m	1	99	Vandenberg SMR CCSR to Big Sycamore Canyon SMR				
soft 0 - 3000m	0						
Estuary	1	132	Mugu Lagoon SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	136	Mugu Lagoon SMRMA to San Elijo Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Lapis 2		High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	2	97	Coal Oil Point SMR to Point Vicente Cluster	77	Laguna Cluster to South Boundary of SCSR		
Surfgrass	2	108	Point Vicente Cluster to South Boundary of SCSR	97	Coal Oil Point SMR to Point Vicente Cluster		
Kelp persistence	1	202	Coal Oil Point SMR to South Boundary of SCSR				
Maximum kelp	2	97	Coal Oil Point SMR to Point Vicente Cluster	77	Laguna Cluster to South Boundary of SCSR		
hard 0 - 30m proxy	2	108	Point Vicente Cluster to South Boundary of SCSR	97	Coal Oil Point SMR to Point Vicente Cluster		
hard 30 - 100m	1	231	Point Conception/Humqag SMR to South Boundary of SCSR				
hard 100 - 3000m	2	142	Vandenberg SMR CCSR to Point Vicente Cluster	108	Point Vicente Cluster to South Boundary of SCSR		
soft 0 - 30m proxy	1	86	Point Conception/Humqag SMR to Big Sycamore Canyon SMR				
soft 30 - 100m	0						
soft 100 - 200m	0						
soft 200 - 3000m	1	99	Vandenberg SMR CCSR to Big Sycamore Canyon SMR				
soft 0 - 3000m	0						
Estuary	1	132	Mugu Lagoon SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	136	Mugu Lagoon SMRMA to San Elijo Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Lapis 2		Moderate-High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	2	97	Coal Oil Point SMR to Point Vicente Cluster	77	Laguna Cluster to South Boundary of SCSR		
Surfgrass	2	108	Point Vicente Cluster to South Boundary of SCSR	97	Coal Oil Point SMR to Point Vicente Cluster		
Kelp persistence	1	202	Coal Oil Point SMR to South Boundary of SCSR				
Maximum kelp	2	97	Coal Oil Point SMR to Point Vicente Cluster	77	Laguna Cluster to South Boundary of SCSR		
hard 0 - 30m proxy	2	108	Point Vicente Cluster to South Boundary of SCSR	97	Coal Oil Point SMR to Point Vicente Cluster		
hard 30 - 100m	1	231	Point Conception/Humqag SMR to South Boundary of SCSR				
hard 100 - 3000m	2	142	Vandenberg SMR CCSR to Point Vicente Cluster	108	Point Vicente Cluster to South Boundary of SCSR		
soft 0 - 30m proxy	1	86	Point Conception/Humqag SMR to Big Sycamore Canyon SMR				
soft 30 - 100m	0						
soft 100 - 200m	0						
soft 200 - 3000m	1	99	Vandenberg SMR CCSR to Big Sycamore Canyon SMR				
soft 0 - 3000m	0						
Estuary	1	132	Mugu Lagoon SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	136	Mugu Lagoon SMRMA to San Elijo Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Table 4.3c

Opal		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	94	Coal Oil Point SMR to Point Vicente SMR				
Rocky Shores	1	94	Coal Oil Point SMR to Point Vicente SMR				
Surfgrass	2	95	Point Vicente SMR to Sunset Cliffs Cluster	94	Coal Oil Point SMR to Point Vicente SMR		
Kelp persistence	1	188	Coal Oil Point SMR to Sunset Cliffs Cluster				
Maximum kelp	1	94	Coal Oil Point SMR to Point Vicente SMR				
hard 0 - 30m proxy	2	94	Coal Oil Point SMR to Point Vicente SMR	84	Point Vicente SMR to Del Mar SMR		
hard 30 - 100m	1	231	Vandenberg SMR CCSR to Sunset Cliffs Cluster				
hard 100 - 3000m	1	222	Vandenberg SMR CCSR to Del Mar SMR				
soft 0 - 30m proxy	1	124	Point Conception SMR to Point Vicente SMR				
soft 30 - 100m	1	134	Coal Oil Point SMR to Laguna Cluster				
soft 100 - 200m	1	134	Coal Oil Point SMR to Laguna Cluster				
soft 200 - 3000m	1	139	Vandenberg SMR CCSR to Point Vicente SMR				
soft 0 - 3000m	1	94	Coal Oil Point SMR to Point Vicente SMR				
Estuary	1	132	Point Mugu Estuary SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	132	Point Mugu Estuary SMRMA to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Opal		High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	65	Coal Oil Point SMR to Lechuza Cluster				
Rocky Shores	1	65	Coal Oil Point SMR to Lechuza Cluster				
Surfgrass	2	95	Point Vicente SMR to Sunset Cliffs Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
Kelp persistence	2	125	Lechuza Cluster to Sunset Cliffs Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
Maximum kelp	1	65	Coal Oil Point SMR to Lechuza Cluster				
hard 0 - 30m proxy	2	84	Point Vicente SMR to Del Mar SMR	65	Coal Oil Point SMR to Lechuza Cluster		
hard 30 - 100m	1	231	Vandenberg SMR CCSR to Sunset Cliffs Cluster				
hard 100 - 3000m	2	114	Lechuza Cluster to Del Mar SMR	111	Vandenberg SMR CCSR to Lechuza Cluster		
soft 0 - 30m proxy	1	96	Point Conception SMR to Lechuza Cluster				
soft 30 - 100m	2	69	Lechuza Cluster to Laguna Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
soft 100 - 200m	2	69	Lechuza Cluster to Laguna Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
soft 200 - 3000m	1	111	Vandenberg SMR CCSR to Lechuza Cluster				
soft 0 - 3000m	1	65	Coal Oil Point SMR to Lechuza Cluster				
Estuary	1	132	Point Mugu Estuary SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	132	Point Mugu Estuary SMRMA to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Opal		Moderate-High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	65	Coal Oil Point SMR to Lechuza Cluster				
Rocky Shores	1	65	Coal Oil Point SMR to Lechuza Cluster				
Surfgrass	2	95	Point Vicente SMR to Sunset Cliffs Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
Kelp persistence	2	125	Lechuza Cluster to Sunset Cliffs Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
Maximum kelp	1	65	Coal Oil Point SMR to Lechuza Cluster				
hard 0 - 30m proxy	2	84	Point Vicente SMR to Del Mar SMR	65	Coal Oil Point SMR to Lechuza Cluster		
hard 30 - 100m	1	231	Vandenberg SMR CCSR to Sunset Cliffs Cluster				
hard 100 - 3000m	2	114	Lechuza Cluster to Del Mar SMR	111	Vandenberg SMR CCSR to Lechuza Cluster		
soft 0 - 30m proxy	1	96	Point Conception SMR to Lechuza Cluster				
soft 30 - 100m	2	69	Lechuza Cluster to Laguna Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
soft 100 - 200m	2	69	Lechuza Cluster to Laguna Cluster	65	Coal Oil Point SMR to Lechuza Cluster		
soft 200 - 3000m	1	111	Vandenberg SMR CCSR to Lechuza Cluster				
soft 0 - 3000m	1	65	Coal Oil Point SMR to Lechuza Cluster				
Estuary	1	132	Point Mugu Estuary SMRMA to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	132	Point Mugu Estuary SMRMA to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Table 4.3d

Topaz		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	93	Helo SMR to Palos Verdes SMR				
Rocky Shores	2	93	Helo SMR to Palos Verdes SMR	78	Laguna Cluster to South Boundary of SCSR		
Surfgrass	2	132	Helo SMR to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR		
Kelp persistence	1	202	Helo SMR to South Boundary of SCSR				
Maximum kelp	2	93	Helo SMR to Palos Verdes SMR	78	Laguna Cluster to South Boundary of SCSR		
hard 0 - 30m proxy	2	93	Helo SMR to Palos Verdes SMR	78	Laguna Cluster to South Boundary of SCSR		
hard 30 - 100m	1	231	Point Conception SMR to South Boundary of SCSR				
hard 100 - 3000m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
soft 0 - 30m proxy	1	132	Helo SMR to Laguna Cluster				
soft 30 - 100m	1	93	Helo SMR to Palos Verdes SMR				
soft 100 - 200m	1	93	Helo SMR to Palos Verdes SMR				
soft 200 - 3000m	1	138	Vandenberg SMR CCSR to Palos Verdes SMR				
soft 0 - 3000m	1	93	Helo SMR to Palos Verdes SMR				
Estuary	1	162	Carpinteria Salt Marsh SMR to Agua Hedionda Lagoon SMR				
Coastal Marsh (area)	1	166	Carpinteria Salt Marsh SMR to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Topaz		High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	65	Helo SMR to Point Dume Cluster				
Rocky Shores	2	78	Laguna Cluster to South Boundary of SCSR	65	Helo SMR to Point Dume Cluster		
Surfgrass	3	78	Laguna Cluster to South Boundary of SCSR	68	Point Dume Cluster to Laguna Cluster	65	Helo SMR to Point Dume Cluster
Kelp persistence	1	202	Helo SMR to South Boundary of SCSR				
Maximum kelp	2	78	Laguna Cluster to South Boundary of SCSR	65	Helo SMR to Point Dume Cluster		
hard 0 - 30m proxy	2	93	Helo SMR to Palos Verdes SMR	78	Laguna Cluster to South Boundary of SCSR		
hard 30 - 100m	1	231	Point Conception SMR to South Boundary of SCSR				
hard 100 - 3000m	2	140	Point Dume Cluster to South Boundary of SCSR	111	Vandenberg SMR CCSR to Point Dume Cluster		
soft 0 - 30m proxy	2	68	Point Dume Cluster to Laguna Cluster	65	Helo SMR to Point Dume Cluster		
soft 30 - 100m	1	65	Helo SMR to Point Dume Cluster				
soft 100 - 200m	1	65	Helo SMR to Point Dume Cluster				
soft 200 - 3000m	1	111	Vandenberg SMR CCSR to Point Dume Cluster				
soft 0 - 3000m	1	65	Helo SMR to Point Dume Cluster				
Estuary	1	128	Magu/ Muwu Lagoon SMRMA to Agua Hedionda Lagoon SMR				
Coastal Marsh (area)	1	132	Magu/ Muwu Lagoon SMRMA to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Topaz		Moderate-High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	1	65	Helo SMR to Point Dume Cluster				
Surfgrass	1	68	Point Dume Cluster to Laguna Cluster				
Kelp persistence	1	131	Deer Creek SMCA to Ocean Beach Cluster				
Maximum kelp	0						
hard 0 - 30m proxy	1	93	Helo SMR to Palos Verdes SMR				
hard 30 - 100m	1	217	Point Conception SMR to Ocean Beach Cluster				
hard 100 - 3000m	2	140	Point Dume Cluster to South Boundary of SCSR	111	Vandenberg SMR CCSR to Point Dume Cluster		
soft 0 - 30m proxy	1	68	Point Dume Cluster to Laguna Cluster				
soft 30 - 100m	0						
soft 100 - 200m	0						
soft 200 - 3000m	1	111	Vandenberg SMR CCSR to Point Dume Cluster				
soft 0 - 3000m	0						
Estuary	1	128	Magu/ Muwu Lagoon SMRMA to Agua Hedionda Lagoon SMR				
Coastal Marsh (area)	1	132	Magu/ Muwu Lagoon SMRMA to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Table 4.3e

External A		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	2	134	Campus Point SMR to Laguna Cluster	76	Laguna Cluster to South Boundary of SCSR		
Surfgrass	1	202	Campus Point SMR to South Boundary of SCSR				
Kelp persistence	1	202	Campus Point SMR to South Boundary of SCSR				
Maximum kelp	2	134	Campus Point SMR to Laguna Cluster	76	Laguna Cluster to South Boundary of SCSR		
hard 0 - 30m proxy	1	202	Campus Point SMR to South Boundary of SCSR				
hard 30 - 100m	1	232	Point Conception SMR to South Boundary of SCSR				
hard 100 - 3000m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
soft 0 - 30m proxy	1	86	Point Conception SMR to Big Sycamore Canyon Cluster				
soft 30 - 100m	0						
soft 100 - 200m	1	81	Big Sycamore Canyon Cluster to Laguna Cluster				
soft 200 - 3000m	1	99	Vandenberg SMR CCSR to Big Sycamore Canyon Cluster				
soft 0 - 3000m	0						
Estuary	1	183	Goleta Slough SMR to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	183	Goleta Slough SMR to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

External A		High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	2	97	Campus Point SMR to Point Vicente Cluster	76	Laguna Cluster to South Boundary of SCSR		
Surfgrass	1	108	Point Vicente Cluster to South Boundary of SCSR				
Kelp persistence	1	202	Campus Point SMR to South Boundary of SCSR				
Maximum kelp	1	76	Laguna Cluster to South Boundary of SCSR				
hard 0 - 30m proxy	2	108	Point Vicente Cluster to South Boundary of SCSR	97	Campus Point SMR to Point Vicente Cluster		
hard 30 - 100m	1	232	Point Conception SMR to South Boundary of SCSR				
hard 100 - 3000m	2	143	Vandenberg SMR CCSR to Point Vicente Cluster	108	Point Vicente Cluster to South Boundary of SCSR		
soft 0 - 30m proxy	1	86	Point Conception SMR to Big Sycamore Canyon Cluster				
soft 30 - 100m	0						
soft 100 - 200m	0						
soft 200 - 3000m	1	99	Vandenberg SMR CCSR to Big Sycamore Canyon Cluster				
soft 0 - 3000m	0						
Estuary	1	183	Goleta Slough SMR to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	183	Goleta Slough SMR to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

External A		Moderate-High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	0						
Rocky Shores	1	97	Campus Point SMR to Point Vicente Cluster				
Surfgrass	1	91	Point Vicente Cluster to Sunset Cliffs Cluster				
Kelp persistence	1	186	Campus Point SMR to Sunset Cliffs Cluster				
Maximum kelp	0						
hard 0 - 30m proxy	2	97	Campus Point SMR to Point Vicente Cluster	91	Point Vicente Cluster to Sunset Cliffs Cluster		
hard 30 - 100m	1	216	Point Conception SMR to Sunset Cliffs Cluster				
hard 100 - 3000m	2	143	Vandenberg SMR CCSR to Point Vicente Cluster	108	Point Vicente Cluster to South Boundary of SCSR		
soft 0 - 30m proxy	1	86	Point Conception SMR to Big Sycamore Canyon Cluster				
soft 30 - 100m	0						
soft 100 - 200m	0						
soft 200 - 3000m	1	99	Vandenberg SMR CCSR to Big Sycamore Canyon Cluster				
soft 0 - 3000m	0						
Estuary	1	183	Goleta Slough SMR to Batiquitos Lagoon SMR				
Coastal Marsh (area)	1	183	Goleta Slough SMR to Batiquitos Lagoon SMR				
Eelgrass	1	244	Santa Ynez River CCSR to Batiquitos Lagoon SMR				
Tidal Flats	NA						

Table 4.3f

External B		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	151	Big Sycamore Cluster to South Boundary of SCSR	98	Vandenberg SMR CCSR to Big Sycamore Cluster		
Rocky Shores	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
Surfgrass	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
Kelp persistence	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
Maximum kelp	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
hard 0 - 30m proxy	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
hard 30 - 100m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
hard 100 - 3000m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
soft 0 - 30m proxy	2	151	Big Sycamore Cluster to South Boundary of SCSR	98	Vandenberg SMR CCSR to Big Sycamore Cluster		
soft 30 - 100m	2	151	Big Sycamore Cluster to South Boundary of SCSR	98	Vandenberg SMR CCSR to Big Sycamore Cluster		
soft 100 - 200m	2	151	Big Sycamore Cluster to South Boundary of SCSR	98	Vandenberg SMR CCSR to Big Sycamore Cluster		
soft 200 - 3000m	2	151	Big Sycamore Cluster to South Boundary of SCSR	98	Vandenberg SMR CCSR to Big Sycamore Cluster		
soft 0 - 3000m	2	151	Big Sycamore Cluster to South Boundary of SCSR	98	Vandenberg SMR CCSR to Big Sycamore Cluster		
Estuary	2	138	Mugu Lagoon SMRMA to San Dieguito Lagoon SMR	112	Santa Ynez River CCSR to Mugu Lagoon SMRMA		
Coastal Marsh (area)	2	138	Mugu Lagoon SMRMA to San Dieguito Lagoon SMR	112	Santa Ynez River CCSR to Mugu Lagoon SMRMA		
Eelgrass	1	262	Santa Ynez River CCSR to Sweetwater Marsh SMR				
Tidal Flats	NA						

External B		High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	3	98	Vandenberg SMR CCSR to Big Sycamore Cluster	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR
Rocky Shores	2	127	Goleta Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR		
Surfgrass	1	151	Big Sycamore Cluster to South Boundary of SCSR				
Kelp persistence	1	198	Goleta Cluster to South Boundary of SCSR				
Maximum kelp	2	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR		
hard 0 - 30m proxy	1	198	Goleta Cluster to South Boundary of SCSR				
hard 30 - 100m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
hard 100 - 3000m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
soft 0 - 30m proxy	2	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR		
soft 30 - 100m	2	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR		
soft 100 - 200m	3	98	Vandenberg SMR CCSR to Big Sycamore Cluster	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR
soft 200 - 3000m	3	98	Vandenberg SMR CCSR to Big Sycamore Cluster	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR
soft 0 - 3000m	2	79	Big Sycamore Cluster to Laguna Cluster	78	Laguna Cluster to South Boundary of SCSR		
Estuary	2	138	Mugu Lagoon SMRMA to San Dieguito Lagoon SMR	112	Santa Ynez River CCSR to Mugu Lagoon SMRMA		
Coastal Marsh (area)	2	138	Mugu Lagoon SMRMA to San Dieguito Lagoon SMR	112	Santa Ynez River CCSR to Mugu Lagoon SMRMA		
Eelgrass	1	262	Santa Ynez River CCSR to Sweetwater Marsh SMR				
Tidal Flats	NA						

External B		Moderate-High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	98	Vandenberg SMR CCSR to Big Sycamore Cluster				
Rocky Shores	1	93	Goleta Cluster to Palos Verdes Cluster				
Surfgrass	1	91	Palos Verdes Cluster to Sunset Cliffs Cluster				
Kelp persistence	2	93	Goleta Cluster to Palos Verdes Cluster	91	Palos Verdes Cluster to Sunset Cliffs Cluster		
Maximum kelp	0						
hard 0 - 30m proxy	2	93	Goleta Cluster to Palos Verdes Cluster	91	Palos Verdes Cluster to Sunset Cliffs Cluster		
hard 30 - 100m	1	230	Vandenberg SMR CCSR to Sunset Cliffs Cluster				
hard 100 - 3000m	1	245	Vandenberg SMR CCSR to South Boundary of SCSR				
soft 0 - 30m proxy	0						
soft 30 - 100m	0						
soft 100 - 200m	1	98	Vandenberg SMR CCSR to Big Sycamore Cluster				
soft 200 - 3000m	1	98	Vandenberg SMR CCSR to Big Sycamore Cluster				
soft 0 - 3000m	0						
Estuary	2	138	Mugu Lagoon SMRMA to San Dieguito Lagoon SMR	112	Santa Ynez River CCSR to Mugu Lagoon SMRMA		
Coastal Marsh (area)	2	138	Mugu Lagoon SMRMA to San Dieguito Lagoon SMR	112	Santa Ynez River CCSR to Mugu Lagoon SMRMA		
Eelgrass	1	262	Santa Ynez River CCSR to Sweetwater Marsh SMR				
Tidal Flats	NA						